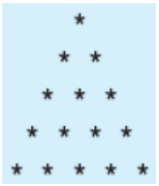
Problem 1 [3 marks]

Write a program that recursively computes the total number of bowling pins in a pyramid of n rows. Your program should allow for values of n greater than equal to 4.

Do not use loop.



This is just for illustration purpose only . You do not need to display *

Let n represents the number of rows.

If n is	Total pins
5	15
4	10
6	21
7	28

Sample output:

```
How many rows of bowling pins will there be? 7
You will need to set up 28 bowling pins.
```

Code snippet

Filename: prob1_yourstudentid.cpp

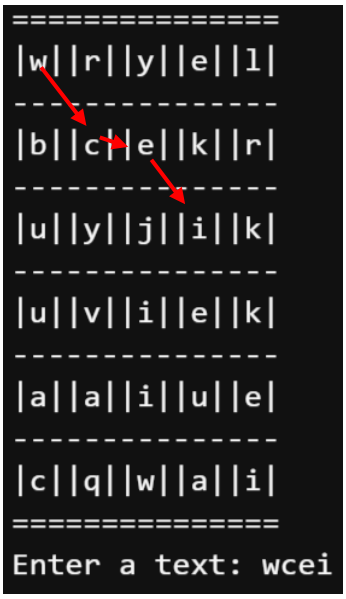
```
// your name

#include <iostream>
using namespace std;

// returns the total pins. Use recursion
int numberOfPins(int rows);

int main()
{

  return 0;
}
```

Problem 2 [12 marks]

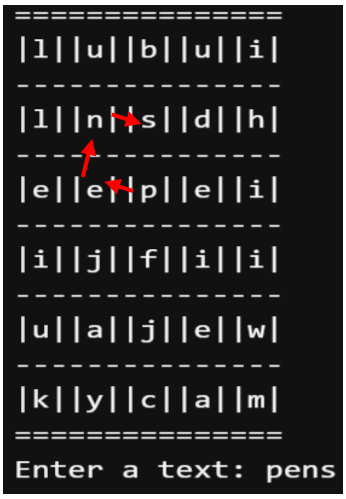
Write a program that would create and display an 6 x 5 matrix filled with random (small) letters. Prompt the user to enter a text, and then determine if the entered letters (in the given text) are adjacent to each other within the matrix.

- Adjacent means that the two letters are near/next to each other.
- You need to use recursion to determine if the letters are adjacent to each other

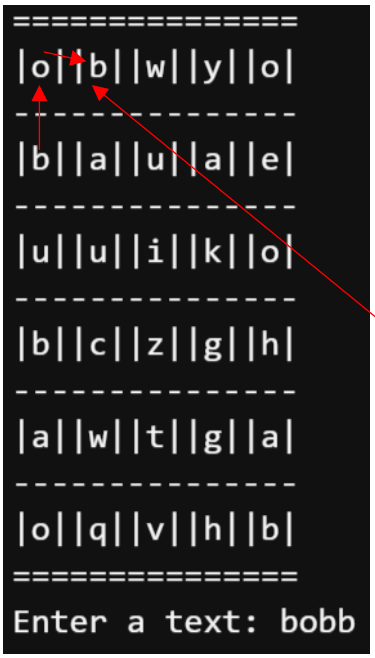
Sample outputs with explanations:



Note: The red line is just for illustration purpose.
Expected output:
Letters wcei are neighbours



Note: The red line is just for illustration purpose.
Expected output:
Letters pens are neighbours



Note:
a. The red line is just for illustration purpose.
b. A letter cannot be used more than once

Expected output:
Letters bobb are not all neighbours

There is no more unused 'b'. Therefore, bobb is not valid

Grading criteria

a. void initialize(char matrix[][5], int row, int col); [2 marks]
   This function fills the matrix with random letters from a to z.

b. void display(const char matrix[][5], int row, int col); [2 marks]
   This function displays the matrix to the console

c. Prompt and capture the user input [1 mark]

d. Function to determine if the letters are adjacent to each other [6 marks]
   I would let you design and decide what parameters and return type are needed to accomplish the required task.

e. Inform the user if the entered letters are all "neighbours" [1 mark]
   Note: The information display should be accurate/correct to earn mark.